Consider the functions $f(x)$ and $g(x)$
$f(x) = \sqrt{x-3}$
$g(x) = x^3$
Answer the following questions about the functions $f(x)$ and $g(x)$.

Exercise 1 *What are domain and range of $f(x)$?*
Domain: $[\boxed{3}, \boxed{\infty})$
Range: $[\boxed{0}, \boxed{\infty})$

Exercise 1.1 *What are domain and range of $g(x)$?*
Domain: $(\boxed{-\infty}, \boxed{\infty})$
Range: $(\boxed{-\infty}, \boxed{\infty})$

Exercise 1.1.1 *Find the following compositions of functions:*
$f(g(x)) = \boxed{\sqrt{x^3-3}}$
$g(f(x)) = \boxed{(\sqrt{x-3})^3}$
$f(f(x)) = \boxed{\sqrt{\sqrt{x-3}-3}}$
$g(g(x)) = \boxed{x^9}$

Exercise 1.1.1.1 *What are domain and range of $f(g(x))$?*
Domain: $[\boxed{3^{\frac{1}{3}}}, \boxed{\infty})$
Range: $[\boxed{0}, \boxed{\infty})$

Exercise 1.1.1.1.1 *What are domain and range of $g(f(x))$?*
Domain: $[\boxed{3}, \boxed{\infty})$
Range: $[\boxed{0}, \boxed{\infty})$

